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AT THE
NASA CONFERENCE ON AEROSPACE TECHNOLOGY
FOR CIVIL AVIATION:
THE 70s AND BEYOND

LANGLEY RESEARCH CENTER

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- * The Conference covers the three-day period November 2-4. Dr. Fletcher spoke at the Banquet held at the Williamsburg Inn, Williamsburg, Virginia.

NASA'S GROWING ROLE IN CIVIL AVIATION

THIS IS MY FIRST CHANCE SINCE COMING TO NASA LAST MAY TO CONCENTRATE ON NASA'S ROLE IN CIVIL AVIATION IN A PUBLIC FORUM. I WELCOME THIS OPPORTUNITY, BECAUSE I THINK NASA'S ROLE IN CIVIL AVIATION IS ALREADY IMPORTANT -- AND SHOULD BE INCREASING.

I WOULD LIKE TO STRESS TONIGHT THE CHANGING NATURE OF NASA'S ROLE IN CIVIL AVIATION AS I SEE IT, AND WHAT THE TRENDS ARE. I THINK IT MIGHT BE USEFUL TO GIVE YOU MY PERSPECTIVE ON WHAT'S NEW FROM A POLICY STANDPOINT; AT LEAST IT HAS BEEN USEFUL FOR ME, IN THINKING ABOUT TONIGHT'S ASSIGNMENT, TO APPROACH IT IN THAT WAY.

CIVIL AVIATION NEEDS GREATER NASA SUPPORT

ONE VERY ENCOURAGING DEVELOPMENT IN WASHINGTON IS THE GROWING REALIZATION THAT CIVIL AVIATION NEEDS MORE NASA SUPPORT. IT NEEDS THIS SUPPORT IN THE FORM OF NEW TECHNOLOGY CONSCIOUSLY DEVELOPED TO MEET THE SPECIFIC AND URGENT NEEDS OF CIVIL AVIATION. AS YOU KNOW, FROM THE BEGINNING OF THE NACA IN 1915, AND CONTINUING WITH NASA, MUCH OF OUR AERONAUTICAL WORK HAS BEEN UNDERTAKEN TO MEET MILITARY NEEDS.

THERE HAS, OF COURSE, ALWAYS BEEN A TACIT ASSUMPTION, OFTEN CORRECT, THAT THESE ACTIVITIES WOULD INDIRECTLY SERVE THE NEEDS OF CIVIL AVIATION AS WELL.

CERTAINLY A BIG FACTOR IN THE QUESTION OF U. S. DOMINANCE IN THE JET TRANSPORT MARKET WAS THE EARLY DEVELOPMENT OF MILITARY FIGHTERS, BOMBERS, AND TRANSPORTS IN THIS COUNTRY, PARTICULARLY THE B47. ENGINE DEVELOPMENT, WING AND BODY DESIGN, FLUTTER AND DYNAMIC STABILITY WERE DEALT WITH EARLIER ON MILITARY AIRCRAFT.

IN THE FUTURE, AS IN THE PAST, TECHNICAL PROGRESS IN MILITARY AVIATION WILL CONTINUE TO BENEFIT CIVIL AVIATION. TWO FACTORS ARE AFFECTING THIS RELATIONSHIP. FIRST, THERE IS A DIMINISHING NUMBER OF MILITARY AIRCRAFT TO BORROW FROM, PARTICULARLY BOMBERS; AND SECOND, AIR TRANSPORTATION HAS NOW BECOME A MOST IMPORTANT PART OF OUR NATIONAL LIFE, AND AIRCRAFT MANUFACTURING A MOST IMPORTANT PART OF OUR ECONOMY AND OVERSEAS TRADE. FOR THESE REASONS, A MORE DIRECT APPROACH MUST BE TAKEN. THE DIRECT APPROACH IS THE ONLY WAY TO MEET THE URGENT RESEARCH AND TECHNOLOGY NEEDS OF CIVIL AVIATION WITHOUT WAITING FOR THE MORE OR LESS FORTUITOUS BENEFITS OF DEFENSE-ORIENTED ACTIVITIES.

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NASA'S NEW PARTNER: DOT

NASA HAS ALWAYS HAD A VERY CLOSE RELATIONSHIP TO THE FEDERAL AVIATION ADMINISTRATION. THIS RELATIONSHIP IS CONTINUING, BUT WITHIN THE LARGER FRAMEWORK AND SCOPE PROVIDED BY THE MORE RECENTLY ESTABLISHED DEPARTMENT OF TRANSPORTATION. THIS CLOSE RELATIONSHIP WILL HELP US DEFINE THE NEW RESEARCH AND TECHNOLOGY NEEDED SPECIFICALLY FOR CIVIL AVIATION. IT WILL ALSO REQUIRE US TO THINK OF CIVIL AVIATION'S ROLE IN RELATION TO OTHER COMPLEMENTING AND COMPETING MODES OF TRANSPORTATION. AND IT MAY WELL DEMAND THAT WE SHARPEN THE FOCUS OF OUR WORK AND PERHAPS DO A BETTER JOB OF EXPLAINING THE POTENTIAL BENEFITS OF THE AERONAUTICAL WORK WE PROPOSE TO DO, OR HAVE DONE.

STATEMENT →
UNDER THE LEADERSHIP OF THE DEPARTMENT OF TRANSPORTATION, VIGOROUS NEW APPROACHES ARE BEING MADE TOWARD FORMULATING A NATIONAL TRANSPORTATION POLICY COVERING RAIL, HIGHWAY, AND WATER MODES AS WELL AS CIVIL AVIATION. IT IS IMPORTANT THAT ALL OF US STUDY THE STATEMENT ON NATIONAL TRANSPORTATION POLICY SUBMITTED TO CONGRESS BY SECRETARY VOLPE ON SEPTEMBER 8 OF THIS YEAR. IT HELPS TO DEFINE THE NEW DIRECTION THAT BOTH NASA AND DOT ARE TAKING.

As Secretary Volpe pointed out in his letter of transmittal, the Nixon Administration is "committed to the task of renovating transportation policy." Three pieces of legislation were enacted in 1970, "each representing a unique landmark in transportation policy." They were the Airport and Airway Development Act, the Urban Mass Transportation Act, and the Rail Passenger Service Act.

We can expect that much of NASA's aeronautical work in the future must be aimed at meeting goals set within the framework of new national transportation policy. Our own enthusiasm for the role of aviation, however great, will no longer be enough. We will have to demonstrate how aviation can meet the country's needs in given areas better than the competing modes of transportation can.

The Department of Transportation is a large organization which inevitably must reconcile various competing interests. It is essential that NASA, in working with DOT, remain innovative and responsive, thorough and convincing, so that aviation progress does not bog down in a swamp of conflicting interests. It is NASA's obligation to the nation to identify and demonstrate the potential of new technology but it will be up to others, including many of you, to see that it is put

TO TIMELY USE. IT IS OUR CONTRIBUTIONS THAT WILL ENABLE THE DEPARTMENT OF TRANSPORTATION AND THE GOVERNMENT AS A WHOLE TO CHOOSE WISELY AMONG THE VARIOUS ALTERNATIVES ON THE BASIS OF SOUND AND COMPLETE INFORMATION. SOMEBODY WE WILL HAVE TO MAKE AN EFFECTIVE COMBINATION OF ENTHUSIASM AND SCIENTIFIC DETACHMENT, OF PASSION AND IMPECCABLE LOGIC. IF WE SUCCEED WE WILL HAVE A GOOD FORMULA FOR CONTINUED AERONAUTICAL PROGRESS.

THE CARD POLICY STUDY

I HAVE BEEN VERY FAVORABLY IMPRESSED BY THE POLICY STUDY ON CIVIL AVIATION RESEARCH AND DEVELOPMENT PREPARED JOINTLY BY DOT AND NASA AND RELEASED THIS SPRING ABOUT THE TIME I JOINED NASA. THIS IS THE SO-CALLED CARD POLICY STUDY, WITH WHICH I AM SURE YOU ARE QUITE FAMILIAR. I THINK IT WILL BE VERY USEFUL IN DEFINING OUR PRIORITIES AND THE GENERAL DIRECTION OF OUR WORK. I WOULD LIKE TO SEE ONE DEVELOPED FOR THE MILITARY SIDE -- A MARD POLICY STUDY.

WE MUST KEEP IN MIND THAT THE CARD STUDY REPRESENTS ONLY THE COORDINATED VIEWPOINTS OF DOT AND NASA. TO IMPLEMENT THE COURSES OF ACTION RECOMMENDED OR IMPLIED IN THE STUDY REQUIRES BUDGETARY DECISIONS BY NASA AND/OR DOT AND, OF COURSE, APPROVAL BY THE PRESIDENT AND THE CONGRESS.

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THE IMPORTANCE OF THE ENVIRONMENTAL ISSUE

ANOTHER THING I WANT TO STRESS TONIGHT IS THE GROWTH OF THE ENVIRONMENTAL ISSUE, AND THE RESPONSE TO IT IN THE CARD STUDY AND IN NASA PROGRAMS.

WE HAVE, I BELIEVE, FACED UP TO THE FACT THAT THE FURTHER GROWTH OF CIVIL AVIATION IS BEING RESTRAINED BY RISING PUBLIC RESISTANCE TO THE NOISE, POLLUTION, AND CONGESTION AT OUR AIRPORTS AND IN OUR AIRWAYS.

THE CARD STUDY SAYS, "AIRCRAFT NOISE ABATEMENT DESERVES HIGHEST PRIORITY BECAUSE OF WIDESPREAD CONCERN FOR THE ENVIRONMENT AND BECAUSE THE SUCCESS OF THE NOISE-ABATEMENT PROGRAM WILL AFFECT THE SOLUTION TO OTHER PROBLEMS," SUCH AS THE PROBLEM OF FINDING SUITABLE LOCATIONS FOR NEW AIRPORTS.

I THINK IT WOULD HAVE BEEN HARD TO BELIEVE, A FEW YEARS AGO, THAT AIRCRAFT NOISE ABATEMENT WOULD BE ACCORDED SUCH HIGH RESEARCH PRIORITY FOR CIVIL AVIATION IN 1971. BUT THAT IS THE SITUATION, AND WE MUST RESPOND TO IT.

I PERSONALLY WELCOME THE CHALLENGE THIS PRESENTS BECAUSE IT PROVIDES A SHOWCASE FOR TECHNOLOGY. IT PROVIDES AN UNUSUAL OPPORTUNITY TO APPLY TECHNOLOGY DIRECTLY TO THE SOLUTION OF AN ENVIRONMENTAL PROBLEM OF INCREASING PUBLIC CONCERN. BY DEMONSTRATING OUR ABILITY TO IMPROVE THE QUALITY OF THE ENVIRONMENT, WE CAN DO MUCH TO WIN OVER THOSE WHO DEFARE TECHNOLOGY AS THE ROOT OF ALL EVIL IN MODERN SOCIETY.

TODAY'S ENVIRONMENTALISTS ARE NOT JUST THE PERSONS WHO LIVE NEAR AIRPORTS AND UNDER OUR FLIGHT PATHS. THEY ARE ALSO THE ONES WHO BUY TICKETS ON OUR AIRLINES. THEY ARE THE PEOPLE WHO ARE ASKED TO PAY TAXES TO SUPPORT AERONAUTICAL RESEARCH. IN FACT, THE CONCERNED ENVIRONMENTALISTS THESE DAYS ARE ALMOST EVERYBODY.

IT IS NO LONGER ENOUGH TO THINK IN TERMS OF MORE POWER, MORE LIFT, MORE SPEED. IF WE WISH THE TAXPAYER TO CONTINUE TO SUPPORT CIVIL AVIATION, WE SHOULD TAKE AS OUR MOTTO, "FLY QUIET!"

NASA CAN BE PROUD OF THE PROGRESS THAT HAS BEEN MADE TOWARD REDUCING AIRCRAFT NOISE. I BELIEVE WE CAN GET STRONG SUPPORT IN WASHINGTON TO CONTINUE THIS GOOD WORK.

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ADDING ENVIRONMENTAL FACTORS TO OUR RESEARCH WORK IN AVIATION MAY COMPLICATE IT -- BUT IT SHOULD MAKE IT MORE INTERESTING, TOO, MORE CHALLENGING, AND MORE REWARDING IN THE LONG RUN.

SINCE THE DAYS OF THE LINDBERGH FLIGHT, 44 YEARS AGO, THE AMERICAN PEOPLE HAVE BELIEVED IN THE FUTURE OF AVIATION AND SOUGHT THE BENEFITS OF AIR TRANSPORTATION. IT WOULD BE A TERRIBLE SETBACK FOR THE AVIATION INDUSTRY -- AND A TRAGEDY FOR THE COUNTRY AS A WHOLE -- IF WE LOST THIS WIDESPREAD FEELING OF GOODWILL FOR AVIATION OVER SUCH ISSUES AS NOISE, POLLUTION, AND CONGESTION.

WE DON'T HAVE TO LOSE IT. YOU ARE THE EXPERTS. BUT I'M SURE YOU CAN AGREE WITH ME WHEN I SAY WE CAN DESIGN PLANES THAT ARE QUIETER AND LESS POLLUTING AND STILL MORE EFFICIENT, IF WE MAKE THE TECHNOLOGICAL EFFORT AND IF WE ARE GIVEN THE RESOURCES TO DO THE JOB.

I HOPE THAT IS THE MESSAGE YOU WILL BE GETTING AT THIS LANGLEY CONFERENCE, BECAUSE I EXPECT NASA TO BE LINED UP ON THE SIDE OF THE ENVIRONMENT IN BOTH WORD AND DEED. AVIATION PROGRESS IN THIS COUNTRY IN THIS DECADE CLEARLY REQUIRES A CONSCIOUS AND INDEED CONSPICUOUS EFFORT TO ENHANCE THE QUALITY OF AMERICAN LIFE.

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THE DOT STATEMENT ON NATIONAL TRANSPORTATION POLICY IS A DOWN-TO-EARTH DOCUMENT. AND IT SPEAKS OF "THE MYRIAD PROBLEMS CONFRONTING AMERICA'S TRANSPORTATION, SPANNED BY ENVIRONMENTAL AND SOCIAL CONCERNS WHICH ARE INCREASINGLY DEMANDING MORE ATTENTION AND RESOURCES. THEY WILL CERTAINLY NOT DIMINISH IN THE FUTURE," SAYS THE STATEMENT. BUT IT ALSO GOES ON TO SAY: "THE IMPORTANT QUESTION IS HOW SUCCESSFUL SOCIETY WILL BE IN RECONCILING THESE ENVIRONMENTAL AND SOCIAL CONCERNS WITH ITS NEED FOR REASONABLY ECONOMICAL AND EFFICIENT TRANSPORTATION, ESPECIALLY AS OUR POPULATION GROWS AND THE PROPENSITY TO TRAVEL CONTINUES TO INCREASE." RESEARCH SCIENTISTS AND ENGINEERS HAVE A WORTHY CHALLENGE IN HELPING TO BRING ABOUT THIS RECONCILIATION.

THE STOL RESEARCH PLANE: A NEW DEPARTURE

THE DECISION TO BUILD A STOL (SHORT TAKEOFF AND LANDING) RESEARCH AIRPLANE IS AN IMPORTANT NEW DEPARTURE FOR NASA, AND FOR THE COUNTRY, FOR A NUMBER OF REASONS:

- THIS WILL BE THE FIRST TIME NASA HAS BUILT A COMPLETELY NEW PLANE FOR RESEARCH PURPOSES.
- IT IS THE FIRST RESEARCH PROGRAM OF THIS MAGNITUDE FOCUSED ON THE NEEDS OF CIVIL RATHER THAN MILITARY AVIATION.

-- AND IT DEMONSTRATES THE HIGH PRIORITY BEING GIVEN TO ENVIRONMENTAL FACTORS.

THE DECISION TO BUILD THE STOL RESEARCH AIRPLANE WAS MADE IN THE CURRENT NASA BUDGET, WITH STRONG BIPARTISAN SUPPORT FROM CONGRESS. WE HOPE TO HAVE THE FIRST OF THE TWO PLANES TO BE BUILT IN THE AIR ABOUT THREE YEARS FROM NOW, AND THE SECOND ONE ABOUT SIX MONTHS LATER.

DESPITE THE DIFFICULT BUDGET SITUATION IN GENERAL, I BELIEVE IT IS MOST IMPORTANT THAT WE PROCEED PROMPTLY TO DESIGN, FABRICATE AND FLY THIS NEW RESEARCH PLANE. OTHERWISE, THE TECHNOLOGY WE WISH TO DEMONSTRATE AND TEST WILL BECOME OBSOLETE BEFORE IT CAN BE USED, AND FOREIGN MANUFACTURERS WITH SUBSTANTIAL HELP FROM THEIR GOVERNMENTS MAY DOMINATE THE LARGE POTENTIAL MARKET FOR THIS KIND OF PLANE AT HOME AND ABROAD.

CIVIL AVIATION AND THE BALANCE OF TRADE

IN RECENT MONTHS, THE GOVERNMENT AND THE PEOPLE OF THE UNITED STATES HAVE BEEN INCREASINGLY DISTURBED BY THE DECLINE IN OUR BALANCE OF TRADE. THIS, TOGETHER WITH THE NEGATIVE VOTE IN CONGRESS ON THE SST, HAS LED TO REAL CONCERN ABOUT WHETHER WE CAN CONTINUE TO HOLD OUR CURRENT ADVANTAGE IN THE WORLD AIRCRAFT MARKET.

THE STATISTICS, AS OF NOW, ARE IMPRESSIVE. THEY ARE SET FORTH IN DETAIL IN THE C.A.D. STUDY.

IT IS UNDERSTANDABLE THAT THE EUROPEANS, THE JAPANESE, AND THE SOVIET UNION WOULD LIKE A MUCH LARGER SHARE OF THIS MARKET.

TO BEAT THIS FOREIGN COMPETITION, THERE ARE A NUMBER OF THINGS WE CAN DO, AND MAY HAVE TO DO. WE MUST STRESS HERE THE URGENT IMPORTANCE OF MAKING A SUFFICIENT INVESTMENT IN NEW TECHNOLOGY, THIS YEAR AND NEXT. THERE ARE MANY MEASURES WE CAN TAKE TO PROMOTE U. S. AIRCRAFT SALES WHEN THE TIME COMES. BUT WE CANNOT TAKE LAST-MINUTE ACTION TO CATCH UP IN NEW TECHNOLOGY. THE TIME FOR THAT KIND OF ACTION IS NOW.

TO HELP THE UNITED STATES STAY COMPETITIVE, NASA WANTS TO MAKE A SUBSTANTIAL TECHNOLOGY EFFORT IN THREE MAJOR AREAS:

- WE WANT TO HELP AMERICAN INDUSTRY MAKE SURE THAT THE BEST AVAILABLE REPLACEMENTS FOR LARGE AMERICAN JETLINERS FIVE AND 10 YEARS FROM NOW ARE NEW AMERICAN JETS.
- WE WANT TO HELP AMERICAN INDUSTRY GET INTO THE MARKET AS SOON AS POSSIBLE WITH SUPERIOR STOL AND VTOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION IN AREAS OF HIGH AND LOW TRAFFIC DENSITY.

-- AND WE WANT TO HELP AMERICAN INDUSTRY ENTER THE NEXT ROUND OF SST COMPETITION WITH A QUIETER, MORE PRODUCTIVE SST OPERATING AT FARES COMPETITIVE WITH THE FARES CHARGED ON THE SUB-SONIC AIRLINERS IN CURRENT USE.

LET US LOOK MORE CLOSELY AT EACH OF THESE POSSIBILITIES:

THE REPLACEMENTS FOR PRESENT JET LINERS WOULD TAKE ADVANTAGE OF THE BREAKTHROUGH WE ARE MAKING WITH THE NASA SUPERCritical WING; THEY WOULD FLY AT ABOUT THE SPEED OF SOUND WITH HIGH EFFICIENCY AND WITHOUT SONIC BOOMS. I SHOULD IMAGINE THAT FOREIGN BUYERS WILL BE AS INTERESTED AS DOMESTIC BUYERS IN THE ADVANCES WE ARE MAKING TO REDUCE AIRCRAFT NOISE AND POLLUTION.

WE ARE BEHIND CANADA AND WESTERN EUROPE IN SOME ASPECTS OF STOL TECHNOLOGY AT THE PRESENT TIME, BUT THERE IS NO REASON WHY WE CANNOT FORGE AHEAD IF WE CONTINUE TO MAKE A SUSTAINED EFFORT TO DEVELOP NEW TECHNOLOGY. THE STOL PLANES BEING PRODUCED ABROAD TODAY HAVE LOW WING LOADING -- WHICH MAKES FOR AN UNCOMFORTABLE RIDE -- AND ARE NOT AS QUIET AS WE THINK A SUCCESSFUL STOL TRANSPORT MUST BE. THE STOL RESEARCH PLANE NASA PLANS TO BUILD WILL EMPHASIZE HIGH WING LOADING TO ASSURE A COMFORTABLE FLIGHT, AS WELL AS QUIETNESS, SAFETY, AND PROFITABLE OPERATION.

IF WE CAN PROVIDE THE TECHNOLOGY TO BUILD STOL AND VTOL AIRCRAFT TO MEET AMERICAN NEEDS, I SHOULD THINK WE CAN ALSO SELL THEM ABROAD.

THE UNFAVORABLE VOTE IN CONGRESS ON THE SUPERSONIC TRANSPORT THIS SUMMER HAS GREATLY INCREASED NASA'S RESPONSIBILITIES FOR PROTECTING THE NATION'S FUTURE IN THIS IMPORTANT AREA OF CIVIL AVIATION.

THE UNITED STATES HAS WITHDRAWN, AT LEAST FOR THE TIME BEING, FROM COMPETITION WITH THE BRITISH AND FRENCH AND WITH THE SOVIET UNION TO PRODUCE AND SELL FIRST GENERATION SUPERSONIC TRANSPORTS. BUT IT IS POSSIBLE TO GET BACK INTO THE COMPETITION LATER IN THE DECADE WITH A SUPERIOR SECOND-GENERATION SST.

NASA IS WELL PREPARED TO DEVELOP NEW SST TECHNOLOGY WHICH WILL PROTECT THE ENVIRONMENT, PERMIT SUPERSONIC FLIGHTS OVER CONTINENTS AS WELL AS OCEANS WITHOUT HARMFUL SONIC BOOM EFFECTS, AND OUTSTRIP THE CURRENT FOREIGN MODELS IN SPEED, CAPACITY, RANGE, AND PROFITABILITY.

I THINK WE SHOULD ESTABLISH A CLEAR NATIONAL POLICY, VERY SOON, TO MAINTAIN OUR LEADING POSITION IN WORLD AIRCRAFT MARKETS.

WE SHOULD RESOLVE TO ACHIEVE THIS GOAL BY WHATEVER REASONABLE MEANS ARE NECESSARY, WITH EMPHASIS ON AN UNAMBIGUOUS DECISION TO STAY OUT FRONT IN AERONAUTICAL RESEARCH AND TECHNOLOGY. NEEDLESS TO SAY, NASA IS MORE THAN WILLING TO STRIVE FOR SUCH LEADERSHIP.

I HOPE THAT THROUGH THIS CONFERENCE, AND ESPECIALLY IN THE REVIEW PANEL DISCUSSIONS ON THURSDAY, YOU CAN HELP US FOCUS OUR EFFORTS TO ASSURE NEW GROWTH AND GREATER OPPORTUNITIES FOR PUBLIC SERVICE TO AMERICAN CIVIL AVIATION.

I THANK YOU.